



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

MAY 13 2008

Certified Mail
Return Receipt Requested

Mr. Jeffrey A. Leed
Leed Environmental, Inc.
Van Reed Office Plaza
2209 Quarry Drive, Suite C-35
Reading, PA 19609

Re: NL Industries, Inc. Superfund Site, Pedricktown, New Jersey
Comments on the November 2007 Focused Feasibility Study For Groundwater
Remediation

Dear Mr. Leed:

The United States Environmental Protection Agency (EPA) has reviewed the Focused Feasibility Study for Groundwater Remediation, (FFS), dated November 2007, which was prepared by CSI Environmental, LLC. for the NL Industries, Inc. Superfund Site (the Site). The FFS describes the current groundwater conditions at the Site and evaluates five remedial alternatives for groundwater including no action, monitored natural attenuation, reagent injection, permeable reaction barriers and pump and treat.

The FFS will require significant revisions. There are numerous statements that are not adequately supported as well as instances in which the FFS deviates from an acceptable format. Given that EPA's general comments are so significant, specific comments will not be provided until the FFS is revised.

EPA's general comments are included with this letter as an attachment. Accordingly, when addressing these comments, please ensure that revisions are made to all sections to which the comments apply. In some instances, specific sections are referenced to provide examples related to the general comment.

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Please update the FFS to address the comments in the enclosure and resubmit the amended report to EPA within 21 calendar days of receipt of this letter. If you have further questions or concerns regarding EPA's comments on the Focused Feasibility Study for Groundwater Remediation, dated November 2007, or if you would like to schedule a conference to discuss the comments, please do not hesitate to contact Theresa Hwilka, of my staff, at 212-637-4409.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Carole Petersen".

Carole Petersen, Chief
New Jersey Remediation Branch

Enclosure

cc: Steve Maybury, NJDEP

ENCLOSURE

GENERAL FFS COMMENTS NL INDUSTRIES, INC.

1. While lead and cadmium may be the primary groundwater contaminants, the FFS must acknowledge and address all contaminants of concern for groundwater included in the 1994 ROD for OU1. The FFS must clarify that the remedial action objectives (RAOs) apply to all contaminants.
2. The FFS states that there are no risk pathways that exist between on-Site contaminants and off-Site receptors; however, this is not the case. Please refer back to the initial baseline risk assessment which is summarized in the 1994 ROD.
3. Remove all definitive statements that can not be supported at this time. For example, statements implying that there is no risk to human health and the environment; no need for remediation; and no nexus between the impacted groundwater and the residents' groundwater should be stricken from the FFS.
4. The Technical Memoranda referenced throughout the FFS are not decision documents and they contain several conclusionary statements that EPA does not agree with. Accordingly, the conclusions presented from the Phase I and Phase II Groundwater Evaluation Technical Memoranda should be removed from the FFS unless they can be otherwise substantiated in a manner that is consistent with EPA policy. For example, on page 8 of the FFS, one of the conclusions referenced from the *Phase II Groundwater Evaluation Technical Memorandum* states that "No pathway exists between on-Site contaminants and off-Site receptors, therefore no off-Site risks exist." Based on EPA's risk assessment guidelines and the initial baseline risk assessment performed for the site, risk pathways do exist; therefore, the Memorandum conclusion is inaccurate and must be removed from the FFS.
5. The FFS states that concentrations of lead and cadmium have decreased over time and that this decrease is the basis for concluding that monitored natural attenuation (MNA) is occurring. EPA disagrees; MNA has not been demonstrated. In order to support MNA as a viable remedial alternative, an evaluation needs to be made and presented in the FFS in accordance with the guidelines specified in the *Monitored Natural Attenuation of Inorganic Contaminants in Groundwater, Volumes I & II* guidance documents which can be found at the following web addresses:

<http://www.epa.gov/ada/download/reports/600R07139/600R07139.pdf>

<http://www.epa.gov/ada/download/reports/600R07140/600R07140.pdf>

Please refer to pages 6 – 20 of Volume II which outline the criteria necessary for determining whether remediation of cadmium and lead via monitored natural attenuation is a viable remedy for the site. Specifically, CSI should note the sections describing the Tiered Analysis approach of site assessment which details how the rate and mechanism(s) of attenuation are determined for lead and cadmium.

6. The following list contains specific comments related to the issue of MNA as discussed in Comment 5 above.

- a. *Page 9, 1st paragraph; Page 15, Section 2.3.2:* As discussed in comments for previous reports, CSI's statements regarding decreased concentrations of cadmium and lead may be misleading, especially where cadmium is concerned. Between 2004 and 2007, cadmium concentrations have increased in wells 22 (dissolved), 30R, 31, JS (dissolved), JDR, KDR, OS, and SD, and lead concentrations have increased in wells 27, OS, and SD (dissolved). Furthermore, the extent of the cadmium plume has decreased very little in size since 1998 and numerous wells show concentrations above New Jersey Groundwater Quality Standards (NJGWQS). Rather than making generalized statements concerning lead and cadmium concentrations, CSI should address trends in individual wells.
- b. *Page 10, Section 1.2.4, 1st paragraph, Page 11, Section 1.2.5, 3rd bullet, Page 19 – No Action Alternative & Page 25:* The FFS states that as pH levels in the central portion of the site naturally equilibrate, lead and cadmium precipitate out of solution and adsorb to native soils, particularly to iron and manganese oxides/hydroxides coatings on soil particles. In order to validate this statement, CSI should provide the following information:
 - i. Phase diagrams showing lead and cadmium species formation at a range of pH levels and recent laboratory data of soil samples analyzed for the various species;
 - ii. pH isopleth maps showing pH levels across the site since 1983; and
 - iii. A calculation of cation exchange capacity at a range of pHs. The capacity of soil to adsorb lead, as calculated in the January 2000 Phase II *Groundwater Evaluation Technical Memorandum (Phase II)* prepared by GeoSyntec Consultants, was based on 3 soils samples with an average pH of 6.5. This average may not be representative of soil conditions across the site, nor does it take into account the effect of groundwater pH, which is much lower, on soil adsorption capacity.

While pH levels in the central portion of the site are remaining relatively stable (with the exception of well OS which shows significantly decreased pH levels since 1998), they are all still in the acidic range and wells 28, KSR, KDR, and SD have pH levels below 4. Furthermore, wells 13 – 17 and wells 12, 26, and JS show decreasing levels of pH. At these acidic levels, lead and cadmium are likely to remain in the dissolved phase and under most circumstances will not precipitate/adsorb out of solution.

7. Please note that some of EPA's comments on the 2007 Groundwater Monitoring Report (GWMR), as provided in both the March 13, 2008 and April 16, 2008 comment letters, may be relevant to portions of the FFS. Please ensure that the revisions made to the GWMR are reflected in the FFS, where applicable.
8. Please ensure that the sections of the FFS follow the guidance outlined in the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA/540/G-89/004, October 1998), with respect to content and format. For example:
 - a. Section 2.3 of the FFS, entitled General Response Actions, does not currently contain a discussion of the response actions. Furthermore, this discussion section should include an estimation of areas or volumes of the affected media to which the groundwater treatment may be applied.
 - b. Section 1.2.3 describing the Nature and Extent of Contamination appears to be repeated in Section 2.3.2. In addition, Section 1.2.3 should include an objective presentation of the data. The interpretation of data belongs in the sections which evaluate the remedial alternative.
9. *Page 28, Section 3.4.3 & Page 30, Long-term effectiveness and Permanence, 2nd paragraph:* In the conclusion of the Bench Scale Treatability Study (BSTS), Appendix A, WRT Services, Inc. (WRT) assumed that lead and cadmium were incorporated into a crystal lattice structure, and were thereby made insoluble and immobile. WRT expressed the need to conduct further testing to evaluate this assumption because the tests they performed measured the effectiveness of different reagents at precipitation without analyzing the structure of the resulting precipitate. This testing should be conducted to confirm the stability of the end product and to ensure that the end product is unlikely to be re-solubilized. Chemical equations explaining the mechanisms of the above reactions and phase diagrams should also be included as part of the description of the alternative.

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Mr. Jeffrey A. Leed
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2209 Quarry Drive, Suite
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Theresa Hwilka
New Jersey Remediation Branch
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